REMARKS

1. Summary of Office Action

In the Final Office Action mailed December 22, 2006, the Examiner rejected claims 1-8 and 10-29 under 35 U.S.C. § 103(a) by allegedly obvious over a combination of U.S. Patent No. 6,564,267 (Lindsay) and U.S. Patent No. 5,809,254 (Matsuzono).

2. Status of the Claims

By this response, Applicants have amended claims 1, 11, and 22 and 25. Now pending in this application are claims 1-8 and 10-29, of which claims 1, 11, 22, and 25 are independent.

3. Summary of the Claimed Invention

Applicants' claimed invention is directed, in various ways, to a method and system of reducing message fragmentation when data packets are transferred between a data source and a data receiver. As set forth in the specification and various claims of the present application, a device, such as a Smart Traffic Engineer (STE), receives an announcement message containing information on a maximum segment size of a first connection between a data source and a data receiver. The STE determines a new maximum segment size that will generate a relatively fragment free connection between the data source and the data receiver. The determined maximum segment size will then be used for any subsequent data connections for transferring data over the network between the data source and the data receiver. By intercepting an announcement message and determining a new maximum segment size, the STE will drastically reduce, if not entirely eliminate, fragmentation of any subsequent messages being sent between the data source and the data receiver will not be fragmented during the transfer.

It should be understood that the preceding brief summary is intended to call attention to only certain aspects of Applicants' presently claimed invention that are relevant to the following

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discussion. Consequently, the summary should not be viewed as encompassing all aspects previously disclosed and/or claimed, or limiting the scope of Applicants' presently claimed invention in any new manner.

4. Cited Art

a. Lindsay

Lindsay is directed to a network adapter that "advertises a large packet data maximum segment size (MSS) to its host, even though it cannot support this MSS on its physical connection." *See* Lindsay at Abstract. Lindsay teaches that when the host tries to negotiate remote connection using the large MSS, "the adapter performs packet header manipulations such that the host believes it has negotiated a large MSS connection, and the remote endpoint believes it has negotiated a smaller, physically achievable MSS connection." *Id.* at Abstract. Further, Lindsay teaches that "[u]sing its knowledge of the local and remote MSS values, the adapter transparently segments the large packets into multiple smaller packets that are digestible by the remote endpoint and transmits these according to the remote endpoint's receive window." *Id.* at Abstract.

According to Lindsay, the network adapter establishes a MSS to send packets over the network, but then misinforms the host of the MSS that the network adapter is using to send data packets to the remote endpoint. The host, therefore, is unaware of what the remote endpoint is capable of handling and continues to form large data packets, which it transfers to its network adapter. Lindsay explains that this is done to "decrease the workload of the CPU and decrease bus utilization by the adapter." *Id.* at Abstract. The network adapter then segments the large data packets sent from the host into smaller ones that the remote endpoint can handle.

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b. Matsuzono

Matsuzono is directed to a method of using a segment table when sending data packets from one host computer to another. As shown in Figures 2 and 3, the segment table lists multiple network addresses, in which each network address has a corresponding MSS value. Matsuzono teaches that a host computer will sequentially read the segment table to retrieve a MSS value based on a destination of a data packet. *See* Matsuzono at column 2, line 56 to column 3, line 47.

For example, as shown in Figure 2, if a destination computer has a network address of "133.203.2.14", the host computer will then retrieve a MSS value of "1460byte." The host computer will then use this retrieved MSS values to send data packets to the destination host computer that has the corresponding network address of "133.203.2.14". Alternatively, if the destination computer has a network address of "133.203.2.0", the host computer will then retrieve a MSS value of "1024byte." The host computer will then use this retrieved MSS value to send data packets to the destination computer that has the corresponding network address of "133.203.2.0".

5. Response to Examiner's Rejections of Claims 1-8, 10, and 25-29.

As noted above, the Examiner rejected independent claims 1 and 25 under 35 U.S.C. § 103(a) as being obvious over a combination of Lindsay and Matsuzono. Under M.P.E.P. § 2143, in order to establish a *prima facie* case of obviousness of a claim over a combination of references, the Examiner must establish that the combination discloses or suggests every element recited in the claim.

Applicants respectfully traverse the obviousness rejections of independent claim 1 and 25, because the Lindsay and Matsuzono combination fails to disclose or suggest all the claim elements. In particular, as set forth below, the combination of Lindsay and Matsuzono fails to

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disclose or suggest a method of reducing message fragmentation between a data source and a data receiver.

(i) Lindsay Does Not Reduce Message Fragmentation Between Data Source And Data Receiver And In Fact, *Guarantees Message Fragmentation*.

Lindsay, as noted in the summary section, is concerned with reducing the workload of the host CPU. In particular, Lindsay teaches a method of allowing a network adapter to perform packet header manipulations such that the host believes it has negotiated a large MSS connection, thereby causing the host to form large packets. Lindsay's adapter, however, negotiates a connection with remote endpoint having a smaller MSS, and proceeds to fragment the packets received from the host in order to transmit them to the remote endpoint. *See* Lindsay, at Abstract.

In effect, Lindsay allows the host to form and send large packets consistent with a larger maximum segment size to its network adapter. The network adapter then transparently segments the "large packets ***into multiple smaller packets*** that are digestible by the remote endpoint." *Id.* at Abstract. (Emphasis added.). The fragmented packets are then sent over the network to the remote endpoint. Thus, Lindsay teaches a method of using a network adapter that effectively guarantees increased message fragmentation.

To illustrate by way of example, Lindsay's Figure 6 shows a host TCP/IP 24 that sends a 9K data packet to a network adapter 42. Because the remote endpoint 40 is only capable of dealing with a MSS that is actually much smaller than the MSS reported to the host, network adapter 42, as shown in Figure 6, segments the 9K block of data from host 24 into six packets, each having a size 1.5K. *Id.* at Figure 6. Lindsay, in reference to Figure 6, explains that "[b]ecause the host in this example has avoided creating six separate packets and issuing six requests to the network adapter, it has reduced its packet processing overhead substantially." *Id.*

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at column 7, lines 56-59. In this way, the network bears the burden of transparently segmenting large packets sent from the host into multiple smaller packets that are digestible by the remote endpoint.

In contrast to Lindsay, Applicants' independent claim 1, recites a method of reducing message fragmentation between a data source and data receiver. On page 2 of the Office Action, the Examiner cited to Lindsay's to column 6, lines 45-65 and column 5, lines 49-64 in an effort to establish that Lindsay teaches a method of generating an altered announcement message by changing a maximum segment size to a determined maximum segment size wherein the determined maximum segment size reduces message fragmentation. For each of the cited portions of Lindsay relied upon by the Examiner, Applicant submits the following:

- Column 6, lines 45-65: This portion in Lindsay teaches a method of establishing a connection between a host and remote endpoint such that the host operates under the assumption that the remote endpoint has agreed to larger MSS value, when in fact, the remote endpoint has agreed to operate at a much smaller MSS value. For instance, the cited portion states that the "host then operates under the assumption that the remote endpoint has agreed to an MSS of 8760 octets and has supplied a window size of 17560 octets. The remote endpoint then operates with an agreed MSS of 1460 octets and an advertised receive window of 5840 octets". *See* Lindsay at column 6, lines 60-65. Because the host is misinformed that the remote endpoint has agreed to communicate with a smaller MSS value, the network adapter will transparently segment messages so that the remote endpoint can operate at the agreed smaller MSS value. Thus, Lindsay's method of intercepting a large packet from the host and altering the MSS value when communicating with the remote endpoint results in an increase in message fragmentation. For this reason, Applicant submits that this cited portion does not teach a method of generating an

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altered announcement message by changing said maximum segment size to a determined maximum segment size ***wherein the determined maximum segment size reduces message fragmentation*** and in fact, teaches the exact opposite.

- Column 5, lines 49-64: This portion in relates to Lindsay's Figure 4, which describes a prior art method of negotiating an MSS, but does not include Lindsay's method of intercepting and altering messages, which Lindsay does in order to cause the host to formulate large messages. There is no discussion in this portion of generating an altered announcement message by changing said maximum segment size to a determined maximum segment size wherein the determined maximum segment size reduces message fragmentation.

For this reasons, Applicant submits that Lindsay does not reduce message fragmentation between data source and data receiver and in fact, guarantees message fragmentation.

(ii) Matsuzono Does Not Teach How Lindsay's Method of Increasing Message Fragmentation Could Be Modified to Instead Reduce Message Fragmentation

As an initial matter, Applicants believe the Examiner has failed to provide a reasoned statement as to the basis for the rejections. Applicants respectfully submit that there is no proper motivation to combine the references. On page 3 of the Office Action, the Examiner stated that "[g]iven the teachings of Matsuzono it would have been obvious to modify Mulligan by including an optimal segment size determinator to determine the maximum segment size for the data transmission in order to reduce message fragmentation." Applicants, however, are unsure of the Examiner's basis for combining Lindsay and Matsuzono.

First, the Examiner referred to a reference not used in rejecting each of Applicants' pending claims. For instance the Examiner stated that "it would have been obvious to modify Mulligan". Applicants submit that it is not clear as to why it would have been obvious to modify

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Mulligan, when on page 2 of the Office Action the Examiner did not use Mulligan to reject each of Applicants' pending claims. Applicants, however, assume that the Examiner was referring to Lindsay, and not Mulligan.

Second, in the statement of the motivation to combine the references, the Examiner cited to functionality not present in Applicants' claims. For instance, the Examiner stated that it would have been obvious to include an "optimal segment size determinator to determine the maximum segment size for the data transmission". Applicants' independent claim 1, however, does not recite an "optimal segment size determinator" and therefore Applicants are unclear of how an "optimal segment size determinator" could be included in Lindsay to reduce message fragmentation.

Third, the Examiner has made inconsistent statements about what the primary reference, Lindsay, does or does not disclose. For instance, on 2 of the Office Action, the Examiner stated that Lindsay discloses a "determined maximum segment size [that] reduces message fragmentation." However, on page 8 of the Office Action, the Examiner stated that Lindsay does not disclose "a determined maximum segment size that provides a reduction of message fragmentation." Because of such conflicting statements about Lindsay's teachings, Applicants are unsure of the Examiner's basis for combining Lindsay and Matsuzono.

Further, Applicants respectfully submit that the Examiner's combination of Lindsay and Matsuzono is improper, as set forth below.

a. No Motivation to Combine Because The Preoferred Combination Fundamentally Changes Lindsay's Principle of Operation

Applicants respectfully submit that the combination is improper pursuant to M.P.E.P. § 2143.01, which states that "[i]f proposed modification would render the prior art invention being

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modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification."

On page 3 of the Office Action, the Examiner proposed that it would have been obvious to modify Lindsay to reduce message fragmentation. Applicants submit that the Examiner's proposed modification, however, would make Lindsay's unsatisfactory for its intended purpose.

To explain, Lindsay teaches a method of sending messages from a host to a remote endpoint via a network adapter that effectively guarantees message fragmentation. Lindsay's network adapter intentionally allows the host to send packets with a large MSS value even when the network adapter has agreed to communicate with the remote endpoint using a small MSS value. The network adapter takes the burden of transparently segmenting packets on behalf of the host when sending messages to the remote endpoint. Lindsay explains that this "decreases the workload of the host CPU". *See* Lindsay at abstract.

Since Lindsay's method guarantees an increase in message fragmentation, Examiner's proposed modification of Lindsay by adding elements of Matsuzono to somehow reduce message fragmentation would make Lindsay unsatisfactory for its intended purpose. For this reason, Applicants submit that there is insufficient reason to combine Lindsay and Matsuzono.

b. Even if Combined, Applicant's Claimed Element of "negotiating a maximum segment size for a connection with a data receiver to reduce message fragmentation by altering an announcement" is Missing

Even if the combination of references as set forth by the Examiner is appropriate (which Applicants do not concede), none of the references teach the limitation of "negotiating a maximum segment size for a connection with a data receiver to reduce message fragmentation by altering an announcement" as recited in claim 1. Similarly, none of the references teach the limitation of "a network device connected to the network, wherein said network device intercepts

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communications between said data source and said data receiver, wherein said communications denote a maximum segment size for the network, and wherein said network device changes the maximum segment size of said communications to a determined maximum segment size that provides a reduction of message fragmentation in data transmission between said data source and said data receiver", as recited in Applicant's claim 25. Applicant has reviewed Lindsay and Matsuzono and cannot find any disclosure of these claim limitations, as recited in claims 1 and 25.

Thus, Applicants submit that a proper *prima facie* case of obviousness has not been made. Therefore, Applicants submit that each of Applicant's independent claims 1 and 25 is allowable. Each of dependent claims 2-8, 10, and 26-29 depends from, and thus incorporates all of the limitations of, one of these independent claims. Accordingly, for at least the same reason, claims 2-8, 10, and 26-29 are also allowable.

5. Response to Examiner's Rejections of Claims 11-21

The Examiner rejected independent claim 11 under 35 U.S.C. § 103(a) as being obvious over a combination of Lindsay and Matsuzono. Under M.P.E.P. § 2143, in order to establish a *prima facie* case of obviousness of a claim over a combination of references, the Examiner must establish that the combination discloses or suggests every element recited in the claim.

Applicant respectfully traverses the obviousness rejections of independent claim 11, because the Lindsay and Matsuzono combination fails to disclose or suggest all the claim elements. At a minimum, for instance, the combination of Lindsay and Matsuzono fails to disclose or suggest the elements of (i) "resetting said first connection, wherein resetting said first connection initiates a second connection".

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On page 4 of the Office Action, the Examiner cited to column 8, lines 46-57 in Lindsay in an effort to establish that Lindsay teaches a method of "resetting said first connection, wherein resetting said first connection initiates a second connection". Applicants have reviewed the cited portion and submit that this portion in Lindsay does not teach a method of resetting a first connection between a data source and a data receiver.

Rather, this portion in Lindsay teaches that when a connection is established using a large local MSS, a "connection parameter manager creates a connection record 86 in connection memory 76. It maintains values in the connection record that will be needed in the event that it has to segment a large data block."

Applicants find no disclosure in this cited portion, however, of ***resetting*** an established connection, wherein resetting said first connection initiates a second connection. For this reason, Applicants submit that Lindsay fails to teach a method of "resetting said first connection, wherein resetting said first connection initiates a second connection". Further, Matsuzono does not make up for this deficiency in Lindsay. Applicants have reviewed Matsuzono and cannot find any disclosure of "resetting said first connection, wherein resetting said first connection initiates a second connection".

Thus, Applicants submit that a proper *prima facie* case of obviousness has not been made. Therefore, Applicants submit that independent claim 11 is allowable. Each of dependent claims 12-21 depends from, and thus incorporates all of the limitations of independent claim 11. Accordingly, for at least the same reason, claims12-21 are also allowable.

6. Response to Examiner's Rejections of Claims 22-24

The Examiner rejected independent claim 22 under 35 U.S.C. § 103(a) as being obvious over a combination of Lindsay and Matsuzono. Under M.P.E.P. § 2143, in order to establish a

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prima facie case of obviousness of a claim over a combination of references, the Examiner must establish that the combination discloses or suggests every element recited in the claim.

Applicant respectfully traverses the obviousness rejections of independent claim 22, because the Lindsay and Matsuzono combination fails to disclose or suggest all the claim elements. At a minimum, for instance, the combination of Lindsay and Matsuzono fails to disclose or suggest the elements of "receiving subsequent announcements of connections and inserting said determined maximum segment size into said subsequent announcements of connections to reduce message fragmentation between said data source and said data receiver".

On page 7 of the Office Action, the Examiner cited to column 11, lines 5-24 in Lindsay in an effort to establish that Lindsay teaches a method of "receiving subsequent announcements of connections and inserting said determined maximum segment size into said subsequent announcements of connections to reduce message fragmentation between said data source and said data receiver". Applicants, however, have reviewed the cited portion and submit that Lindsay does not teach this claimed limitation.

Rather, this portion in Lindsay teaches a method of how a connection parameter manager 79 processes incoming packets. In particular, this portion discloses that the connection parameter manager "maintains a table of connections that have been established with different local and remote MSS values." *See* Lindsay at column 11, lines 9-11. Further, this portion teaches that the parameter manager is "responsible for detecting connection synchronization (SYN) packets, outgoing close connection packets (FIN), and modifying WIN in coming packets if appropriate." *Id.* at column 11, lines 7-10.

There is no discussion in this portion, however, of "receiving subsequent announcements of connections and inserting said determined maximum segment size into said subsequent

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announcements of connections to reduce message fragmentation between said data source and said data receiver". For this reason, Applicants submit that Lindsay fails to teach this claimed limitation in Applicants' claims. Further, Matsuzono does not make up for this deficiency in Lindsay. Applicants have reviewed Matsuzono and cannot find any disclosure of "receiving subsequent announcements of connections and inserting said determined maximum segment size into said subsequent announcements of connections to reduce message fragmentation between said data source and said data receiver".

Thus, Applicants submit that a proper *prima facie* case of obviousness has not been made. Therefore, Applicants submit that independent claim 22 is allowable. Each of dependent claims 23-24 depends from, and thus incorporates all of the limitations of independent claim 22. Accordingly, for at least the same reason, claims23-24 are also allowable.

7. Conclusion

In view of the foregoing, Applicants submit that claims 1-8 and 10-29 are allowable, and thus Applicant respectfully requests favorable reconsideration and allowance of these claims. Should the Examiner wish to discuss this case with the undersigned, the Examiner is invited to call the undersigned at (312) 913-3305.

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8. Payment of Fees

Applicant authorizes the Office to charge the $790.00 fee for filing a Request for Continued Examination. Further, Applicant authorizes the Office to charge any additional fees or credit any overpayment to Deposit Account No. 132490.

Respectfully submitted,

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